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CATALOGUES NOS. III AND IV, OF NEBULÆ DIS-
COVERED AT THE LOWE OBSERVATORY,
ECHO MOUNTAIN, CALIFORNIA.

BY DR. LEWIS SWIFT, DIRECTOR.

LIST III.

NO.	DATE OF DISCOVERY.	R. A.	DEC. FOR 1900.	DESCRIPTION.
	1897	h m s	° ' "	
1	Aug. 10,	0 46 45	— 35 0 43	pB eeS E. with 132 & 200 looks like a nebulous D <i>Uranus</i> .
2	Sept. 4,	0 55 0	— 40 53 51	vF. vS. R.
3	Sept. 4,	1 9 45	— 33 11 33	eeF. S. eeE. a ray no * near.
4	Sept. 4,	1 23 35	— 36 17 3	eeF. pS. R. vdif.
5	Sept. 4,	1 33 10	— 34 29 45	vF. S. R. eF. * near nf.
6	Sept. 6,	1 46 45	— 30 26 20	pB. eS. lE. like a D nebulous * with 132 & 200. See No. 1.
7	Sept. 6,	1 53 45	— 33 46 44	eeeF. ps. R. 7 ^m * in field nf. another suspected.
8	Sept. 4,	2 6 0	— 33 29 40	vF. S. vE. one * nr.
9	Sept. 5,	2 11 0	— 31 41 30	pB. pS. lE.
10	Sept. 6,	2 34 3	— 27 52 25	pB. CS. R. 8 ^m * pretty close p.
11	Sept. 5,	2 44 30	— 31 42 30	vF. pS. R. 1 st of 3.
12	Sept. 5,	2 44 32	— 31 36 32	vF. pS. R. 2 ^d of 3.
13	Sept. 5,	2 45 4	— 31 36 32	pF. pS. lE. 3 ^d of 3.
14	July 22,	20 19 10	— 31 11 37	eF. pS. lE. wide D * near s.
15	July 25,	20 20 50	— 36 20 57	pB. vS. eE.
16	Aug. 29,	20 22 0	— 36 22 19	eeS. eE. in meridian.
17	Aug. 29,	20 24 30	— 33 50 57	pF. pS. lE.
18	Aug. 29,	20 36 50	— 30 11 30	vF. pS. R. 2Fst. nr nf point to it. 1 st of 3.
19	Aug. 29,	20 37 5	— 30 11 30	eeF. CS. eE. nr the p * of several in seg- ment of a circle. 2 ^d of 3.
20	Aug. 29,	20 37 30	— 30 1 30	eeeF. pS. vE. eeedif. 3 ^d of 3.
21	July 9,	21 26 5	— 37 9 9	eF. pS. R. an e wide D * f 30 ^s .
22	Aug. 31,	22 3 5	— 28 21 11	eeF. vS. vE. forms right angle 2vF close stars.
23	Aug. 8,	22 36 0	— 45 19 15	pF. pL. R. F * nr sf.
24	Sept. 4,	22 51 10	— 37 7 5	eeF. vS. eeeE. a ray almost a line. np of 1459 Index Cat. Barnard.
25	Sept. 4,	22 52 20	— 36 35 2	vF. vS. R. sf of 2.
26	Sept. 4,	22 52 30	— 36 24 0	pB. pS. R. np of 2.
27	Aug. 8,	23 13 50	— 42 49 45	eeF. S. CE. f of 3. f 7599.
28	Aug. 8,	23 16 15	— 43 3 20	eeeF. pL R. 10 ^m * nr s. 11 ^m * f. eeedif.
29	Aug. 8,	23 23 8	— 42 2 0	pB. pS. R. 9 ^m * close s.
30	Aug. 8,	23 26 59	— 45 36 18	vF. vS. R. bet 2 st. 8 ^m * sp.

NOTES.

List No. 1, of fifty nebulae discovered here, was published in the *Astronomical Journal* of November 13, 1896. List No. 2, of twenty-five, was recently published in *Monthly Notices*, and *Publications* A. S. P. The present list, as will be seen, consists of southern nebulae exclusively. It is a field rich in nebulae, which that mighty Nimrod, Sir WILLIAM HERSCHEL, who hunted the sky over, could not reach. Several are quite bright, and a few are interesting. I have examined GALES' ring nebula, R. A. $21^h 53^m 10^s$, Decl.— $39^\circ 53' 42''$, and find it an interesting one, increasing the number now known to seven. It bears considerable resemblance to the one in *Lyra*, but is not as bright, nor will it bear magnifying like that celebrated one, though it is too far south for me to do justice to it. Numbers 1 and 6 are singular specimens of nebulae, perhaps deserving of a new classification. I have lately seen three, all looking exactly alike.

N. G. C. 1288 is considerably elongated in 0° . It is not round, as Sir JOHN HERSCHEL says.

N. G. C. 1340 must be struck out. It is identical with 1344, as has been suspected. I examined the locality thoroughly for 1340, and I am certain that it does not exist. Some time I intend to take up this matter of doubtful nebulae.

I am glad I have at length found in BARNARD'S field a nebula his keen eye failed to see. See No. 24.

LIST IV.

NO.	DATE OF DISCOVERY.	R. A.	DEC. FOR 1900.	DESCRIPTION.
		h m s	° ' "	
1	Sept. 23, '97	0 11 0	— 39 52 20	eeeF. vL eE. close f 55. See note.
2	Oct. 3, "	0 54 30	— 34 51 32	pB. vS. R. 2 st nf. & 2 np.
3	Sept. 29, "	1 5 0	— 46 31 38	vF. S. R. No B * near. vF one f.
4	Sept. 29, "	1 53 4	— 33 31 27	pB. vS. R. BM. 10^m * v close sp.
5	Sept. 29, "	2 5 0	— 33 25 0	vF. vS. eE. nearly 0° . F * p.
6	Sept. 29, "	2 59 28	— 39 52 38	eF. pS. R. F D * sf points to it.
7	Sept. 26, "	3 31 0	— 34 46 55	pB. S. eeeE. a straight hair-like line $90''$. See note.
8	Sept. 29, "	4 8 45	— 33 7 51	eF. vS. R. BM. 10^m * close s.
9	Sept. 29, "	4 16 30	— 31 41 42	eeF. pL. R.
10	Aug. 10, "	19 53 30	— 38 47 38	vF. S. R. 8^m * f 90° . p of 2. same parallel.
11	Aug. 10, "	19 54 0	— 38 47 38	vF. S. R. 8^m * f. f of 2.
12	July 8, "	20 0 0	— 48 35 50	B. CE. vS. stellar. f of 2.
13	Sept. 23, "	20 10 59	— 41 53 24	vF. CS. R. no B * near.

No.	DATE OF DISCOVERY.	R. A.	DEC. FOR 1900.	DESCRIPTION.
		h m s	° ' "	
14	Sept. 16, "	20 24 25	— 36 39 15	vF. CS. R. several p B st s & f.
15	Sept. 17, "	20 40 25	— 38 50 35	eeF. pS. R.
16	Sept. 15, "	21 1 31	— 30 26 30	eeF. pS. R. F * near f 90°.
17	Sept. 17, "	21 41 0	— 35 21 58	vF. vS. R.
18	Sept. 17, "	21 42 0	— 35 27 0	vF. pL. R. Not 7130, or 7135. sp of 2.
19	Sept. 17, "	21 43 30	— 35 22 10	eeF. pL. R. 3 B st p = Δ . nf of 2.
20	Sept. 27, "	21 49 46	— 49 31 52	eeF. pS. R. in line with 29 ^m St sf. 7 ^m * in field sf.
21	Sept. 23, "	22 51 30	— 43 59 27	pB. S. R. mbM.
22	Oct. 3, "	23 27 45	— 45 35 40	vF. S. R. bet 2 st. 8 ^m * sf. & a 7 ^m * sp.
23	Sept. 23, "	23 39 25	— 43 29 15	vF. eS. R. stellar.
24	Sept. 25, "	23 42 40	— 37 36 53	eeF. CS. R. in vacancy.
25	Sept. 25, "	23 52 25	— 37 34 52	pB. CS. eE. 1 * near sf.

NOTES.

The nebulae in this list, the fourth issued from this observatory, bringing the total to 130, are, as will be seen, all southern nebulae. They are, with few exceptions, very faint, though some are bright enough to come under HERSCHEL'S Class I. That these have not been previously found, shows that the southern sky, including that portion within the reach of Sir WILLIAM HERSCHEL and LORD ROSSE, has not been as thoroughly searched over as has been the northern.

No. 1 = G. C. 27; also, N. G. C. 55, is, with its associated companion, a very remarkable nebula. I am at a loss what to think of it, whether it is all one; the preceding half very bright, very large, exceedingly elongated, the following half exceedingly faint, equally as large, and still more elongated; or, whether they are two distinct nebulae, one partly overlapping the other. If single, it is curved; if double, they are inclined to each other. I am inclined to think they are two distinct nebulae, one reason being that the brighter one ends sharply, which would hardly be the case if the brighter merged into the fainter. The brighter was discovered by DUNLOP, but I doubt if he could have seen the fainter. That Sir JOHN HERSCHEL does not mark it with a sign, as he often has done, meaning a very remarkable or even a remarkable object, lends plausibility to the idea that the fainter was not even seen by him. As, however, it has been illustrated, a reference to that would decide the matter at once.

No. 7. This, in one respect at least, is the most remarkable nebula I have ever seen. I doubt if the entire heavens afford a similar example. If the reader will cut off a short piece of fine, bright brass wire, and hold it up sidewise to the sky, he will form, by looking at it, a very correct idea of how it appeared to me. The line was certainly nebulous. It must be a thin nebulous disk seen exactly edgewise.

G. C. 383 does not exist, and must be struck out. Sir JOHN HERSCHEL makes both 380 and 383 of equal brightness, and the places given would place both well within my field of 31' in diameter, power 132. I made a long and thorough search for 383, and would have found it if there, had it been three times fainter than 380, which is an easy object.

PLANETARY PHENOMENA FOR JANUARY AND FEBRUARY, 1898.

BY PROFESSOR MALCOLM MCNEILL.

JANUARY.

Eclipses. 1898 is richer in eclipses than was 1897. There will be six in all, divided equally between those of the Sun and those of the Moon, and one of each will occur in January.

The first will be a *partial eclipse of the Moon*, and will occur on January 7th. It will be visible in the eastern hemisphere and in the eastern part of the United States, but the Moon will have passed out of the Earth's shadow before moonrise in the western part of the United States. The maximum obscuration is less than one sixth of the Moon's diameter.

The second will be a *total eclipse of the Sun* on the morning of January 22d. No part of it will be visible in the western hemisphere. The line of totality begins in Central Africa, and passes through the Indian Ocean, India, and China. The most accessible part of the Earth for observations is India, and the weather conditions are usually favorable at that time of the year. A large number of expeditions from various parts of the world will be sent to make observations. The duration of the eclipse will be about two minutes.